DEP Mercury Overview

HEALTH CONCERNS FROM MERCURY FOR PEOPLE AND WILDLIFE
Mercury is a powerful neurotoxin that is known to cause neurological deficits and cardiovascular abnormalities in humans and to affect survival, growth and reproduction in fish-eating wildlife. Maine is known to have some of the highest Mercury concentrations in wildlife species near the top of the food chain such as loons and eagles. Eating fish with high concentrations of mercury is the main way that unsafe blood-mercury levels occur for people and wildlife.

Ten to twenty percent of Maine women of childbearing age have blood mercury levels high enough to provide an insufficient margin of safety for protecting a fetus from mercury related effects on development. NESCAUM (a regional air quality research organization) estimates 46,000 newborns in the northeast are at risk for neurological deficits and cardiovascular abnormalities due to mercury. Small amounts of mercury can damage a brain starting to form or grow. This means that babies in the womb, nursing babies and young children are most at risk. Too much mercury may affect behavior and how children learn, think and problem solve later in life. Mercury can also harm older children and adults, but it takes larger amounts. It may cause numbness in hands and feet or changes in vision.

FISH ADVISORIES
Maine Bureau of Health issues fish advisories for freshwater and some ocean fish. Fish advisories are based on fish tissue information collected and measured by DEP. These advisories are at odds with our efforts to promote tourism, aquaculture, and healthier eating habits to reduce heart disease. Because cardiovascular (heart) disease is the leading cause of death by disease in Maine (@ 29,000 hospitalizations and 4000 deaths annually), the secondary health effects of having to limit eating of freshwater and some ocean fish are a concern. Maine was one of the first states to identify high mercury levels in fish and issue fish advisories. Forty-six states including all of New England now have fish advisories. A c*opy of the current (new version under development) fish advisory attached.*

EPA indicates that some of the fish we eat may bioaccumulate mercury in amounts 100,000 to 1 million times greater than the water they swim in. Because of the unsafe amounts of mercury that now bioaccumulate in Maine fish we must observe strict limits on eating fish. Fish-eating wildlife such as loons and eagles are also negatively impacted.

WHERE DOES MERCURY COME FROM?
Humans add mercury to the natural environment through the air and directly into surface and groundwater. The origin of contamination comes from a variety of sources associated with the daily activities of individuals and industries.

<u>Air emissions</u>
Mercury from the air settles into the water by wet deposition (rain, snow, hail, fog, etc.), dry deposition (attaching to small particles) and being incorporated into leaves that fall into the water. The distance of the air emissions from the water, wind direction and other weather conditions affect the amount and location of deposition. For example the 2003 Casco Bay study concluded that between 84 to 92% of the total mercury load in Casco Bay is from air deposition.

The geographic location of Maine is such that prevailing winds blow air pollution (including mercury) into Maine. Most of the mercury air emissions deposited on land and into Maine water from the air is transported from outside the state. Regional, national (primarily coal fired plants in the Midwest) and global sources each contribute approximately 25% to the mercury transported into Maine. In-state sources account for 588 pounds of mercury emissions.

Maine's largest in-state source is from air emissions that are by products of energy and heat production from residential, industrial and commercial boilers or furnaces. Five (5) out of the twenty-five (25) pounds from Industrial Residual Oil Burners are from Electric Utility burning residual fuel oil. Ten (10) out of the thirty-five (35) pounds from Industrial Wood Boilers are from Electric Utilities burning wood.

Volatilization from products, waste handling, vehicle emissions and manufacturing also contributes to mercury emissions. Historically our largest in state sources were the Holtra Chem manufacturing plant in Orrington, and medical and regional waste incinerators.

<u>Water discharges</u>

Mercury may also leach from the land into the groundwater and then discharge to surface water or may directly discharge to surface waters from licensed facilities, spills or mercury added products such as dental amalgam rinsed down the drain.

Products
Some products have Mercury added to them as raw materials, often in spite of equally effective and less toxic alternatives. Lamps, thermostats, thermometers, and auto switches may volatize mercury through breakage and spills, and/or enter groundwater or the air through incineration when solid waste is burned.

HoltraChem
This manufacturing plant closed in September of 2000. During operation it was the single largest source of mercury air emissions in the state and discharged 12 pounds per year of mercury into the water. Closure of Holtra Chem has significantly reduced but not eliminated ongoing mercury contributions. Clean up continues.

MAINE IS A NATIONAL LEADER IN MERCURY REDUCTION!
Maine has reduced its emissions by over 65% from 1990-2002. The New England Governors and Eastern Canadian Premiers (NEG/ECP) developed the landmark bi-national Mercury Action Plan in the late 1990's. In it, the region committed to mercury reductions of 50% by 2002. Reduction goals were exceeded with Maine mercury reductions of 65% and regional reductions of 55%. Maine has a strong record of early recognition of mercury concerns beginning with studies of national significance in the early 1990's. We have air emission limits below federal standards and have strict wastewater discharge limits. We were leaders in our efforts to reduce mercury from our historic chlor alkali plant. We lead the country in mercury added product legislation which includes sales bans, recycling requirements and disposal restrictions. Our hospitals have been recognized as leaders in reducing mercury. Consumers, business & industry, waste handlers, junkyards, hospitals, dentists, NGO's and municipalities have been and will continue to be actively engaged in aggressive mercury reduction efforts. We are national leaders in our continuing efforts to reduce and eliminate in-state mercury sources and continue aggressive efforts at the regional and national level including significant efforts via regional and national organizations (NESCAUM, NEGC/ECP, NEWMOA, ECOS and NEWIPCC). NEC/ECP members including Maine have committed to pursue 75% reductions by 2010.

Emissions
The majority of Maine reductions were achieved by emission reductions (waste incinerators, medical incinerators and Holtra Chem).

In 2004 emission limits for Maine facilities dropped to 50lbs a year or less. Most Maine facilities (manufacturing, waste handling, industrial and commercial sectors) are below this new limit. Reductions from these sectors have had a tremendous positive impact on in state mercury emissions!

Wastewater discharge
Dental facilities handling mercury amalgam (dental filling material) have completed pollution prevention plans and were required to have wastewater separators installed by the end of 2004 with expected decreases in mercury discharge decrease of 98%.

Ongoing wastewater monitoring indicates current discharge limits would allow the 157 municipal and industrial discharge sources to collectively discharge 40lbs/year. June 2003-June 2004 data indicate the discharge sources are doing a wonderful job and all sources combined discharged only 6 lbs. of mercury in that one year time period!

Products
Source reduction from product collection events to date is impressive: 26 lbs. from eliminated dairy manometers, an estimated 35 lbs. from @17,000 collected auto switches, and 700lbs from 80 out of 452 middle and high schools. Recycled lamps, thermostats & other devices are estimated to contain 1,100-lbs that will be recycled.

The Maine Hospital Association has played a leadership role in reducing mercury at their 39 facilities by eliminating mercury added fever thermometers, blood pressure cuffs, esophageal tubes etc. Some hospitals are also looking at other mercury-added products such as vaccines. The last medical waste incinerator closed in 2002. Discussions continue on an autoclave to disinfect medical waste to facilitate in state processing via safe solid waste disposal. The Maine Hospital Association was recognized in 2002 for their leadership role and progress.

Municipalities
Municipalities have been involved via their roles in regional waste incinerators, municipal wastewater treatment plants and installation of recycling spaces at transfer stations for mercury added products such as lamps and other universal waste. *A list of grant awards for recycling facilities is attached.*

CHALLENGES

Transport: Transport of mercury from out-of state coal fired plants is our single largest source of mercury from air deposition. Our in-state efforts will not be enough to reduce mercury levels to a place where our fish are safe to eat. Continued aggressive advocacy and legal action at the state, regional and national level will be needed to minimize new mercury emissions to the atmosphere.

Issues requiring regional or national leadership

- Ensure that large quantities of stockpiled or recovered mercury are retired to avoid reintroduction into commerce and potentially into the environment and
- Coordinate legislation on mercury added products so that special labeling, assembling or formulations for Maine are not required.
- Review federal policy on Total Maximum Daily Load for all waters impaired by mercury. A TMDL is not an effective or possible measure to bring Maine waterbodies into attainment when approximately 75% of mercury emissions are from out of state. This would be a paper exercise of marginal effectiveness given our existing work.

National mercury reduction initiatives

Three initiatives are now positioned for federal action. Two of the proposals fall short of what is needed, and what can be done, to curtail sources of mercury pollution.

On January 26, 2005, a Senate subcommittee heard testimony on "Clear Skies 2005" (S.131), an Administration bill three years in the making. It specifically targets emissions from power plants (nitrogen oxides, sulfur dioxide and mercury) and has industry support as an alternative to the controls authorized under the Clean Air Act.

While touted as reducing mercury emissions from power plants "for the first time", Clear Skies' target is lower (70% reductions) and the timeline (by 2018) longer then those achievable through the Act's currently existing technology-forcing rulemaking (so-called "maximum achievable control technology" or "MACT"). MACT would realize reductions of 90% or better.

If Clear Skies fails, as many observers believe it will, the U.S. Environmental Protection Agency is prepared to issue its delayed "mercury rule" by March 15. That rule proposes "options" for reducing mercury, and one of the options mimics Clear Skies in its target and timeline. Even if finalized, the rule is likely to be the subject of lawsuits, further slowing its implementation.

Much more promising is the bipartisan legislation recently introduced by Senators Collins, Jeffords and Lieberman ("the Clean Power Act of 2005", S. 150). Unlike Clear Skies or the EPA mercury rule, it would not permit facilities to "trade" mercury emissions reductions credits. Instead, it would impose strict limits on mercury emissions, with the target of a 90% reduction (from 1999 levels) by 2009. Mercury emissions would ultimately be capped at all electric generating facilities larger than 15MW.

In state concerns

Air Emissions

Adequate resources for data development continue to be a challenge. Calculated emissions factors (the amount of mercury released per gallon of fuel burned and unique to each fuel source) from out of state sources need to be supplemented with Maine specific data. Recalculation involves significant resources. Similarly, Maine-specific surveys need to be conducted to verify fuel use information that is published by the Department of Energy.

Water discharges

Currently 157 municipal and industrial discharge sources have been assigned a daily maximum and rolling average mercury effluent limit. DEP continues to work with those facilities that have exception to their license limits by having the facilities conduct additional testing of the treatment plant effluent and investigate sewer users for potential sources.

Products

- Maine's ban on disposal of mercury added products was extended to household hazardous waste in 2005. Compliance will be difficult in communities that have not established recycling facilities.
- Recycling rates for mercury containing switches in cars and appliances and for thermostats found in homes and businesses can be significantly improved. Increasing the ongoing education and outreach effort may be effective in meeting that goal.

Holtra Chem

The dismantling and remedial effort at Holtra Chem will continue to reduce mercury release to the air, ground and surface water, with several complex tasks scheduled for completion in the next couple years. Decontamination and dismantling of the cell building equipment is over 90% complete, and preparations are underway to decontaminate and remove external tank and

piping systems beginning in the spring. Dismantling and decontamination of the building itself and preparing for removal or treatment of soils under the building are two significant challenges remaining at the site.

CONCLUSION

Maine government, citizens, advocacy groups and businesses have worked tirelessly for the past decade to reduce mercury contamination and sources. Maine is recognized as a national leader for our efforts to reduce mercury use, discharge and waste. Continuation of these efforts is critical, but it will not achieve our goal of once again being free to eat fish caught in state waters. We remain dependent on aggressive regional and national actions to reduce mercury emissions that contaminate our fish and pose health risks to our children and pregnant and nursing women.

We recommend that the legislature pass a resolve to direct the federal government to support bipartisan legislation recently introduced by Senators Collins, Jeffords and Lieberman ("the Clean Power Act of 2005", S. 150). Unlike Clear Skies or the EPA mercury rule, it would not permit facilities to "trade" mercury emissions reductions credits. Instead, it would impose strict limits on mercury emissions, with the target of a 90% reduction (from 1999 levels) by 2009. Mercury emissions would ultimately be capped at all electric generating facilities larger than 15MW.

Furthermore we may also be in a position to seek a legislative ban on button cell batteries. In the near term a ban on button cells in novelties is in order. With sufficient alternative available that ban could be extended to cover all other button cell battery uses (watches, hearing aids) by 2010.